

**Wisconsin Highway Research Program  
Request for Proposal for  
Aesthetic Coatings for Concrete Bridge Components**

**Questions regarding the content of this RFP are due no later than  
5PM (CDT), Monday, December 5, 2011**

**Responses to questions will be posted to the WisDOT Research and Library website  
(<http://wisdotresearch.wi.gov/rfps-and-proposals>) by Monday, December 12, 2011**

**Proposals are due  
5 PM (CST), Friday, January 13, 2012**

**For further information regarding this RFP  
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**Monday, November 21, 2011**

**Researcher Proposal Preparation Guidelines**

WHRP Proposal Guidelines are available on the WisDOT Research and Library website (<http://wisdotresearch.wi.gov/wp-content/uploads/WisDOT-Policy-Research-proposal-guidelines-master.pdf>). Please refer to these instructions in preparation of your response.

## **I. Background and Problem Statement**

Bridge owners frequently invest significant amounts of money for aesthetic enhancements of bridges. One common application is the utilization of coating materials to enhance the aesthetic quality and durability of concrete components (i.e. parapets, girders, piers, abutments, and wingwalls). Unfortunately, the Wisconsin Department of Transportation (WisDOT) has experienced a number of issues with the performance of these coatings, including peeling, fading, blistering, staining, low resistance to man-made damage (vandalism), etc. It is the intent of this research to find better methods and materials to be used for these aesthetic treatments so that the longevity and cost effectiveness of the practice can be better realized. It is also understood that some of these products, in addition to providing aesthetic benefits, also provide enhanced material protection, including the prevention of both moisture and chemicals. These benefits should be considered in the decision making process.

## **II. Objectives**

The objective of this research is to investigate methods and products to be used in the aesthetic coating of concrete bridge components and to develop a guideline for cost-effective aesthetic practices.

## **III. Scope of Work**

Research tasks shall include but not be limited to the following:

### **Task 1: Literature Review**

Collect, review, and interpret relevant practice, performance data, research findings, and other information related to aesthetical treatments of bridge components. Use sources both domestic and international.

### **Task 2: User Survey**

Survey WisDOT engineers, contractors, consultants, other State DOT's, and manufacturers to obtain information regarding current practice. At a minimum, the survey will address materials used, surface preparation, application, repairs/maintenance of coating, material protection benefits of coating, graffiti resistance of coating, costs, etc.

### **Task 3: Interim Report**

Based on the results of Tasks 1 and 2 develop a revised work plan and suggest products to be tested to meet the objectives of the research. Submit an interim report that includes a summary of the findings from Tasks 1 and 2, suggested materials, and revised work plan to the Project Oversight Committee (POC) for review. ASTM and/or AASHTO testing procedures for durability of coatings shall be utilized, as necessary. Also reference NTPEP as necessary. Approval of work plan by POC must be obtained prior to Task 4 execution.

### **Task 4: Testing and Material Evaluation**

Execute the POC approved work plan.

### **Task 5: Practical Applications and Definition of Research Needs**

Develop/modify special provisions for concrete coatings. Include single and multi-color (replicating varying natural stone coloration) applications. Recommend updates to the WisDOT Bridge Manual as necessary. Develop an updated approved products list, as well as protocols for use by WisDOT and manufacturers in adding new products to the list. Also develop a system for WisDOT to be able to select appropriate coating materials based on cost-effectiveness.

### **Task 6: Project Deliverables**

- **Draft Final Report:** Submit a draft final report three (3) months prior to end of contract for review by the Structures Technical Oversight Committee (TOC). The report will include results of the research and proposed revisions to appropriate special provisions and structural details. Recommended revisions WisDOT Bridge Manual, Standard Specifications, and Approved Products List shall also be included in the Appendix of the report.
- **Project Presentation:** The researcher is required to present the findings of the research including an assessment of implementation potential to the WHP Structures Technical Oversight Committee (TOC).
- **Final Report:** Revise draft final report based on TOC comments and submit final report to WHP. One electronic copy and 15 hard copies of the report are required.

## **IV. WisDOT/TOC Contribution**

- a) Expected Contribution of TOC/WisDOT Staff:
  - i) WisDOT Bureau of Structures will provide existing special provisions details as required. Other contacts (WisDOT region staff, contractors, consultants other DOT's and manufacturers) will be part of the research and will be the responsibility of the PI.
  - ii) TOC membership will provide oversight of research and review of interim and final reports.
- b) WisDOT Equipment
  - i) Researchers should not assume availability of WisDOT equipment in the proposal. If equipment is donated to the project by WisDOT or another entity, a letter of commitment must be included in the proposal. It is not expected that this project will require the use of any WisDOT equipment.

## **V. Budget and Time Frame**

- a) Project Duration:
  - i) The total duration of the project is 27 months, with an anticipated start date of August 1, 2012.
  - ii) The interim report required in Task 3 shall be submitted no later than 9 months after the project start date.
  - iii) The draft final report shall be submitted at least 3 months prior to the end of the contract.
  - iv) Contract is considered closed upon submission of electronic and hard copies of the final report.

- b) Project Budget
  - i) The estimated budget shall not exceed \$120,000 and shall include any costs associated with performing tests, analyzing the data and preparing the draft and final report.
- c) The researcher is expected to submit the draft final report with quality technical writing and proper grammar. It is acceptable to include a technical editor on the research team to ensure these requirements are met.
- d) Matching funds will not be considered in the proposal evaluation process.

## **VI. Implementation**

The final report shall detail all aspects of the research and findings. Also, recommended changes to the WisDOT bridge manual, special provisions and approved products list shall be presented. In addition, protocols for addition of products to the approved products list shall be included.

## **VII. Special Notes**

- The PI should submit, as a part of the proposal, a proposed work plan for all tasks listed above. There will be opportunity for revision to this work plan during Task 3 of the research, but the original work plan proposal will be used as a basis for selecting the PI.
- Travel will be required to visit bridge sites, to meet with the project oversight committee as needed, and to present the report.
- All above tasks shall be addressed in the proposal. However, research isn't limited to the above tasks.
- This investigation shall at a minimum include tests to ascertain the effectiveness in resisting environmental factors, penetration of chlorine ions, adhesion strength, and water vapor transmission rates as well as the repair capability of the specified coating:
  - Material types and combinations (paint, penetrating stain, sealers, etc.)
  - Surface preparation
  - Application (spray, roller, temperature, rain, minimum curing time prior to application, etc.)
  - Durability to fading (Short and Long wave radiation testing utilizing both Xenon and UV tests)
  - Durability to peeling, blistering, staining, etc.
  - Repair (peeling, flaking, graffiti removal, etc.)
  - Material protection (chlorine ion, moisture resistance, etc.)
  - Graffiti and vandalism resistance
  - Cost